PERIODICAL ROOM
GENERAL LIBRARY
UNIV. OF MICH.
SEP 5 1930

The JOURNAL of GEOGRAPHY

VOLUME XXIX SEPTEMBER 1930 NUMBER 6

In This Issue

Brittany: The Backward Child of a Stern Environment . . . . . *Harold S. Kemp*

The Problem of Our Wood Pulp and Paper . . . . . *Albert G. Eldridge*

Reconstructing the Geography of Alabama . . . . . *F. A. Carlson*

Some Special Topics in Geography Which Need Special Consideration by the Teacher . . *Douglas C. Ridgley*

Interest-Stimulating Devices . . . . . .

Published by A. J. NYSTROM & CO., for THE NATIONAL COUNCIL OF GEOGRAPHY TEACHERS
GEORGE J. MILLER, *Editor*

The JOURNAL *of* GEOGRAPHY

A MAGAZINE FOR SCHOOLS

GEORGE J. MILLER, *Editor*

CORA P. SLETTEN, *Assistant Editor*

State Teachers College, Mankato, Minn.

Associate Editors

R. H. WHITBECK, University of Wisconsin, Madison

R. M. BROWN, Rhode Island College of Education, Providence

E. E. LACKEY, University of Nebraska, Lincoln

ERNA GRASSMUCK, State Teachers College, Indiana, Pa.

A. E. PARKINS, George Peabody College for Teachers, Nashville, Tennessee

D. C. RIDGLEY, Clark University, Worcester, Mass.

SUBSCRIPTION TERMS

The subscription price is $2.50 a year, payable in advance. The price of single copies is 35 cents. Postage is prepaid on subscriptions from the United States, Canal Zone, Republic of Panama, Porto Rico, Cuba, Virgin Islands of the United States, Dominican Republic, Philippines, Guam, Samoan Islands, Hawaii, Mexico, Costa Rica, Guatemala, Nicaragua, Republic of Honduras, Salvador, Argentina, Bolivia, Brazil, Colombia, Ecuador, Paraguay, Peru, Uraguay, Spain and Spanish Colonies. Postage is charged extra for Canada and all other countries in the Postal Union as follows: 27 cents on annual subscriptions (total $2.77), on single copies 3 cents (total 38 cents).

The Journal is the official organ of the National Council of Geography Teachers and is sent to all members of the organization. The anunal dues, $2.00, are payable to the *Journal of Geography*. Extra postage rates for copies sent to foreign countries should be added to the membership dues.

Patrons are requested to make all remittances payable to the *Journal of Geography*, in postal or express money orders or bank drafts.

Members and subscribers who wish to continue receiving the *Journal* must send remittances promptly to assure the volume being complete.

Send manuscript and books for notice or review to the *Editor*.
Send orders for back numbers to *Journal of Geography*.

Published monthly except June, July and August

PUBLICATION OFFICES: 450-454 AHNAIP STREET, MENASHA, WISCONSIN

Business Correspondence, Membership Dues, and Subscriptions may be sent to Publication office or to

A. J. NYSTROM AND COMPANY

PUBLISHERS, JOURNAL OF GEOGRAPHY

3333 ELSTON AVENUE, CHICAGO

Entered as second-class matter January 15, 1919, at the postoffice of Menasha, Wisconsin, under the Act of March 3, 1879.

THE JOURNAL OF GEOGRAPHY

CONTENTS FOR SEPTEMBER, 1930

Brittany: The Backward Child of a Stern Environment. By Harold S. Kemp 223

Mr. Kemp has just withdrawn from the teaching force of Dartmouth College to join the staff of the geography department at Harvard University. In addition to the two articles which are appearing this year in the JOURNAL OF GEOGRAPHY, he is contributing a third, "La Martinique—La France dans l'Amerique tropicale" to the *Revue de Geographie Alpine.*

This is the fifth paper in our series of experimental writings in geography. Mr. Kemp has prepared another stimulating article for the series entitled: "Queen City of the Lakes": A Geographic Pageant.

The Problem of Our Wood Pulp and Paper. By Albert G. Eldridge 240

Mr. Eldridge is an instructor in geography and social studies, State Normal School, North Adams, Massachusetts.

Reconstructing the Geography of Alabama. By F. A. Carlson... 258

Dr. Carlson is professor of geography in Ohio State University, and is author of several articles upon the geography of agriculture. He is co-author with Dr. C. C. Huntington of a college text upon geographic principles: Environmental Basis of Social Geography.

Some Special Topics in Geography Which Need Special Consideration by the Teacher. By Douglas C. Ridgley 265

Dr. Ridgley is a professor of geography at Clark University, Associate Editor of the JOURNAL OF GEOGRAPHY and author of many books and articles in the field of geographic education.

Interest-Stimulating Devices 270

Contents of the JOURNAL are indexed regularly in the *Education Index to Periodicals.*

Authors alone are responsible for opinions and statements in the JOURNAL.

The MAPS in Brigham and McFarlane's Essentials of Geography

are superior in their

Pleasing use of color

Their accuracy

Their expressiveness of relief

Their use of shading in showing the stronger slopes of mountains

Their presentation of the new boundaries of countries established since the World War

Their black-and-white maps showing the lands occupied by different peoples of Europe

AMERICAN BOOK COMPANY

New York Cincinnati Chicago Boston Atlanta

The JOURNAL *of* GEOGRAPHY

Copyright, 1930, The Journal of Geography

VOLUME XXIX SEPTEMBER, 1930 NUMBER 6

"BRITTANY: THE BACKWARD CHILD OF A STERN ENVIRONMENT"

HAROLD S. KEMP
Harvard University

One of the treasure-troves of tourists—American, South American and European—is the north-western, peninsular extremity of France which we call "Brittany"—the French, "La Bretagne."

By travelers seeking the picturesque—the different—it is regarded as a find, to be pounced upon with squeals of delight; and for three or four days cameras snap avidly, memorializing this or that quai Then, for the average American, at least, quaintness palls. ding processions become a bore; "pardons" are recognized as being much the same wherever encountered; fish, as a steady diet, ceases to be picturesque; one realizes that there is no daily or weekly quota of galleries to be visited; only one or two trifling châteaux in the whole region; no boulevards; certainly no theaters; worst of all, perhaps, few other Americans, to give one that not-too-far-away feeling. English tourists stick it out thru a holiday of two weeks, with the help of tea, daily "bathes," other Englishmen and the thought that it is cheap. The French, largely from Paris, spend the summer, often in their own villas, on the high, sea-scanning bluffs or tucked into still, warm coves. The Americans flit rapturously thru town and country-side on a three-day bus tour, agree that nothing outside of Holland is nearly so picturesque, and then, having seen and snapped, fly to other fields.

The very factors, largely environmental, which have made and kept Brittany picturesque to a peculiar degree and in unique fashion, are those which so limit the comforts and seductions demanded by the usual tourist, that, admitting its charms, he leaves for other places as charming, less picturesque, and more comfortable.

It is the purpose of this paper, not to prove Brittany a surviving island of the picturesque, but to demonstrate (what must be true in the case of any such survival in the midst of a modern world) that its picturesqueness is the product—the reflection—of such prosaic elements as climate, rock structure, location. In other words, it is a matter of geography; in this case, social geography.

FIG. 1. The characteristic Breton farm wall, filling the spaces between trees which mark the boundaries of fields and farms, and which, in the aggregate, form the *bocage*.

A HARD LAND FOR HARDY FOLK

The land itself is picturesque in a rugged, sometimes bleak and often wild fashion. The granite that has persisted as a peninsula crops out in grey knobs, grey bluffs, grey cliffs. Such forests as are to be found are the scrubby oak or pine that thinly mantle such surfaces in many another place. Mountains there are none, but hills are everywhere. Valleys are short, narrow and tortuous. Coastal plains are as absent as in Maine; as in Maine seas break against massive headlands and build little crescents of sand beach across

every re-entrant. One feels that the stubborn peninsula has been gouged out, ground down; its edges chiseled and hacked. Soil lies thinly in pockets, on the gentler slopes and along the little streams which thread their narrow valleys. Because of their very size there is something snug—almost cozy—about these little valleys, especially since, as one might well suspect, it is into the snuggest valley

FIG. 2. Typical farm house, surrounded by some three hundred feet of close-set granite fencing. The exposed parts of the slabs average three and one-half feet in height, while the house lean-to is built of menhirs rising six feet above ground. These fences are broached by a unique stile—a shorter, wider stone over which one can just step, and which keeps the cow in the farmyard or out of the church yard.

corners that the little Breton hamlets tuck themselves. From the higher hills one sees far across range after range, houseless, wooded, or bare. One moves alone, remote and strangely free on these lonely hills by day; at night, one feels himself a mite between hard granite and hard sky and, if he is a geographer, realizes the geography in those old legends which filled interior Brittany with tales of Merlin's witchcraft.

A picturesque country this, long before man, trying to make the most of so inhospitable a region, added to its charm. One might list here those things which man has added: he has been able to do relatively little, but, appropriately enough—inevitably enough, one suspects—he has done nothing that does not add to the country's inherent quality. Indeed, so closely are environment and the social complex interwoven that one might list those things which the visitor counts as Brittany's "attractions" under environmental heads, thus:

Granite:

Megaliths or menhirs (popularly called Druidic monuments)
Fences, well-copings and windlasses, threshing floors, cottages, barns, farm carts
Wayside crosses, calvaires, ossuaries, churches
Town walls and gates, castles, châteaux, public buildings

Coastline and banks:

Fishing fleets
Fishing villages
Harbor calvaires or images
The fish-wives and fish auction
Votive boat models in the churches
Blessing of the fleet, by priests
Drying nets
Net-makers
Fishing costumes
Artists and their paintings
Pea pickers

Climate:

Moss-covered trees, notably in apple orchards
The crops
The "bocage"—high windbreak hedges
Butter and cattle markets
Drunken peasants

Location:

Peasant costumes
Pardons
Wedding processions and dances on the green
The Breton language
The Breton character

Under these four heads are grouped practically all of those features which make the Breton scene a delight to an outsider.

THE CULTURAL LANDSCAPE REFLECTS THE ENVIRONMENT

Really, there are two scenes Breton, instead of one; the coastal, fishing scene, and the interior, farming scene. Entering the province from elsewhere in France, one is first struck by the wooded aspect of the country. Wherever there is soil, there is cultivation—the cultivation of tiny fields separated one from the other by stone and sod dykes from which spring writhing oak trees, spaced some ten feet apart in a row. These trees serve two purposes—the first, to break the winds which sweep across the peninsula from the sea, and the second, to provide, thru the ruthless annual pollarding of their branches, a supply of fuel in a region where there is no coal. So small have the fields become, thru division with succeeding generations, that these windbreak hedges quickly multiply into what seems at first glance a forest. Indeed, the local term, "bocage," means "grove."

One may traverse this farm country at length without seeing a house, unless his route leads him into a ravine or valley, where he will find a farm village snugly ensconced about the village well —often, the village baking oven, with its heap of fagots. The village is picturesque because of its stout construction of great granite blocks, the ponderous walls of the houses being carried up into massive dormers and the whole monumental construction carrying nothing heavier than a relatively flimsy thatching of straw. Very "different," these houses. About them may be a fence of granite slivers, miniature replicas of those great granite slabs which we call "megaliths," and which were set up in the same land and in the same fashion, by pre-historic folk, long centuries ago. Where one turned off from the highway to plunge down the lane which led to the village hiding-place, was, as at every road intersection, a tall stone cross, hewn from one piece of granite and generally graced with crude local carving, much after the fashion of early New England gravestones, where again, stone had easily suggested itself. The village church is of granite, and because granite is a difficult material in unskilled hands, however devout, the Breton artisans developed a diminutive spire of granite which was adapted

to the material and which has no duplicate elsewhere—one of the most distinctive, wide-spread and delightful things in the province and definitely tied up to the granite area. Beside the church one generally finds that delight of the tourist—the calvaire—a calvary, or crucifix, of granite, some ten to twenty feet high. Since a crucifix demands at least one figure, stone-cutters, in spite of their hard material, developed a crude skill at figure-sculpture which led them

FIG. 3. Buckwheat field, dotted with apple trees. This field is far too large to be typical of Brittany. It was chosen because it afforded the longest hedge found (shown also in Fig. 1), and a wide view of the distant hedges forming the *bocage*.

to add mourning figures about the foot of the cross. So strangely crude, or impressively naturalistic are these figures, that again the resistant material available has helped to evolve a "novelty" for present-day visitors.

In the rear of the church, no doubt, stands another Breton expression of environment—the ossuary, or bone-house. In a region of so little soil, the burying of the dead long ago threatened to be-

come a grief-ending worry and expense to the living; hence, after a few years of mourning, the bones were dug up from their snug but scanty resting place and dumped, with more or less ceremony, into the bone-house, which, occupying a modicum of land, and made of age-resisting granite, solves the problem very well indeed.[1]

The well, which centers the hamlet, has the familiar coping of stone, but on either side is an upright post of granite which sup-

FIG. 4. Landing tuna from the fleet, in which the larger vessels have begun to roll over on their sides as the tide goes out. Breton wharves are not of piling, but of solid granite blocks, as is the town wall across the harbor.

ports a heavy stone windlass—unique to a country where granite is more easily got than wood of any size. Above the windlass one often finds a not ungraceful stone shed, of the lychgate type. Châteaux, in such a country, are rare; while castles, built largely for defense, and town walls, are more common. These, of course, are of granite, as well as the town hall, large or small; the little school-

[1] The oldest standing ossuary dates from the 15th century, showing the pressure of land scarcity as long ago as that.

house; and, in larger towns, a rambling convent. Floors, of course, are of stone, except in cases where comparative wealth justifies the elegance of a deal floor. In the village *place,* the well is one of a community trinity with the stone threshing floor and (in the occasional larger town) the market house, rather necessary in a peninsular climate where drizzles, if not downright rain, are frequent. In fact, this need was recognized so long ago that market-houses are still standing—as, notably, at Le Faouet—which were solidly and confidently set up in granite in the 16th century.

Barns, in striking contrast to the huge painted wood structures of America, are made as small as possible, to minimize stone-masonry, and are almost universally set against the house, to save the building of one wall. This tiny barn is really a stable, housing the cattle and horses, while the hay which figures so largely in this climate, is built into marvelously neat and shapely stacks. The problem of protecting these stacks from the humid climate which evolved them was solved by thatching them—a well-laid and tied thatch being constructed upon each stack.[2]

Crops may not be considered, at first thought, as part of a region's picturesqueness, but second thought, perhaps, will remind one of the distinctive scene peculiar to certain crops, as in the hop country of Surrey; the tulip lands of western Holland; the vineyards of any wine-growing region; olive groves of Italy; or the terraced lemon groves of Sicily; the cotton fields of our own South; the waving sea of western wheat fields or the ordered rows of California's orangeries—to mention only a few. Breton farmers have found that potatoes and other vegetables give best-paying yields on the most fertile soil. These crops, however they figure in Breton economics, do not add perhaps, to the *scène Bretonne.* But the lush hay fields; the orchards, "bearded with moss," and pink with blossom or red with fruit; and under the trees, the elusive pink-white of the buckwheat blossoms make pictures never to be forgotten by one fortunate enough to see them, fretted with the net-work of the pollarded green bocage. Surely the farming country-side makes a striking and beautiful contrasting note with the ever-encountered intervals of scrub-forest or wide stretches of purple-heathered moorland. Apples figure universally, as a part of every agricultural scene, because Brittany lies just north of

[2] This adaptation to a lack of building material is not unique in Brittany, but is to be seen, notably, in treeless Holland and Belgium.

the vine-land, and this part of France, in reluctant but convivial response to the dictum of climate, drinks cider—cider as hard as the granite on which it is grown, and responsible, because of its fiery quality, for far more drunkenness than one sees elsewhere in France, where the milder (and more expensive) wines are in vogue. Imported wines, of course, would be in vogue as well in Brittany, but for the poverty which is associated with so rigorous an environment.[3]

Along the encircling coast of Brittany one finds, added to the *scène rustique,* the *scène maritime.* "Added," because as in most fishing littorals, farming is concomitant with fishing, and extends across every foot of tillable soil to the very edge of the sea-cliff; it is not uncommon, along the Breton coast, to find that a recent fall of rock has torn a crescent out of the green of the season's crop, and tumbled it into the sea.

Bays, inlets and estuaries are half the story of this coast, as rocky promontories are the other half. And each re-entrant has, according to its size, a fishing village.[4]

BRETON FISHING VILLAGES LEAD ALL OTHERS IN CHARM

The fleet, whether strung along the far horizon, streaming in or out in friendly race or lying snug within a rock-ribbed harbor, is a thing of beauty, partly because of the grace not uncommon to craft, but far more, and uniquely, because the thrift of these hard-pressed Bretons has led them to dip their sails in a happily brown-red preserving fluid which renders them more resistant to the moisture of sea and air. The nets, on the other hand, bellying out from the mast-head where they are hung to dry, are dyed blue by this canny old race of fishermen, to the end that they shall be less visible when in the water of the almost-spent, but still blue Gulf Stream. The rare combination of color effects which result, account for such agglomerations of painters, picturesque in themselves, as one can find perhaps nowhere else—not even excepting the four much more limited areas which immediately suggest themselves.

[3] Mark the analogy to "apple-jack"—a liquor of terrific potency—which persists to this day among the interior hill-farmers of New England, where in pre-prohibition days, the lack of corn for whiskey corresponded to the grape-lack in Brittany.

[4] Nature or depth of bottom, and relation to banks or rail transportation determine whether the village shall concern itself with oysters, fresh fish, or sardines and tuna for canning.

The wide range of tide, characteristic of these coasts, plays a variant on the picturesqueness of the fleets at anchor, since one sees the boats, now standing sedate and lovely, mirrored ravishingly in still water, and now lying dully on their round sides, reflections banished by the slimey ooze on which they rest; or standing, stiff and self-conscious, propped up on two stilts, and, thanks

Fig. 5. Sunday in a fishing village. Dresses, except on the very youngest children, are invariably black. The head-dresses vary with the district; on this remote headland, the snowy peak of home-made lace, perched above wind-bronzed faces, attains the last word in the "unbecoming."

to the withdrawn tide, grotesquely, rather than beautifully, picturesque.

On the point of rock which cuts the harbor off from the sea, stands a particularly elaborate calvaire, in propitiation to angry seas, or perhaps a chapel, dedicated to the same end. The small waterfront behind the calvaire or chapel is alive with fisher "types"—men carrying osier baskets of sardines to the *criée*, or auction-shed (if a granite building may be called a "shed"); other

men, and women, carrying a thirty-pound tuna by the tail in each hand, the dry snouts of the fish rasping creepily on the granite of the harbor ramps; dozens of women buyers, each representing a little canning factory, knitting unceasingly on long woolen socks while they scan the incoming fish and haggle over price, or wait, craftily, until the size of the yield brings down the price in the *criée*. Bare-footed children, down to greet their fathers and to carry

FIG. 6. Weekly market at Quimperlé. The corner devoted to pigs, a minor animal industry associated with the skimmed milk of a butter churning region. Women and men are equally interested both in buying and selling; in fact, matrimony is, first and last, a working partnership. There is no room for parasitic wives in Brittany.

back the carefully set-aside fish which is to be cooked for supper—some rare stray—a St. Denis, perhaps, or, equally good, a chance lotte—too good for "us" if there is a tourist hotel, or a railroad to take it to Paris, but an available treat otherwise, because the canneries can handle only the commonplaces—sardines or tuna.

Because their fishing clothes are made of the same material as

the sails, and are equally subject to wetting and consequent rotting, they too are dyed in the same brilliant colors—red or blue—often one, liberally patched with the other. A riot of color—flapping in the wind or stalking about on its own legs—these fishing villages; and yet the artists, frenziedly trying to catch and hold it, paint one awesome canvas after another which manages to be doubly lurid—trebly patch-worked—and so, doubly and trebly interesting and amusing to gaping tourists.

Doubtless on one side of the harbor entrance is a crumbling turreted fort, built long ago when each little remote town had to be a citadel: at St. Malo and Concarneau the fort enclosed the whole village, and in the latter, one still crosses the drawbridge which connects the fortified harbor-island town to the mainland, now strewn with canning factories. On certain days the votive boat-models are taken down from before the church altars, dusted by a heavy hand, and borne out into the sunlight of broad day to be carried around the harbor on litters, each perched on the shoulders of four suddenly important acolytes. "Sisters" come behind, herding the girls, who can only clutter along and envy their brothers; and priests walk before, sprinkling holywater over the harbor, such boats as lie warped to the shore or, in a final comprehensive gesture, in the direction of the others. The townsfolk sing, with feeling, and those who are not in line uncover or bow reverently, hoping that loss is not to come to them this year. On the fringes scatter the American tourists, with an occasional British competitor, snapping the choicer bits, shouting for the film reserves, pushing to "catch" the priest at a critical juncture. It is all—*all*—very picturesque.

Back of the town, in sheltered patches, are fields of peas—(the famed *petits pois de France*)—with their chatting windrow of women pickers, and the great two-wheeled carts piling high with pods. This development (not to be found inland) is added to the picture of the Breton fishing village because there only in Brittany are to be found the canning plants and skilled labor which suggest the brief season of pea-canning as a side-line.[5]

The Breton people, as a social group, reflect, as surely as does the landscape, the environment which is theirs.

[5] Another similar alliance is to be found in Sarlat (in southern France), where the rare presence of native truffles, with consequent canneries, has developed the growing of peas and other choice vegetables for canning, instead of grain.

Farming, they are as poor as other farmers the world over where the land is as unyielding as this. Fishing, they are no more prosperous—no less hard-working—than the fishermen of Norway, Nova Scotia, or Portugal. Townsfolk, almost without exception, are the folk of little towns—of villages; and there is almost nowhere a sophistication which is more than that of little villages.

But the story of Breton character and habit is more than that of a hard land and uncertain hauls; of little, scattered farms, and meager, long-stunted hamlets. It is the story of a people who, in the midst of the world, are out of it; mewed up, like monks in a monastery, on a peninsula. It is the story of a remote people.

Brittany's remoteness lies chiefly in the fact, common to peninsulas, that the province leads nowhere. No great trade route has ever led across it, because to cross it is but to go to, or come from, the sea; and cargoes today, as always, sail the length of its northern or southern coast to reach harbors closer to the busy world of France; to Le Havre on the north, or Nantes, on the south.

In olden days, English armies sometimes slipped across the Channel to strike at France over the shoulder of Brittany; and here France was wont to meet the invader and drive him out, leaving the Bretons to recover from the despoiling, harrying hands of both. Such experiences often repeated and often prolonged, made the Bretons distrustful of the foe across the water and the "ally" to whose land his peninsula was attached. Today he will exclaim, bitterly, *"Oo! Les cochons Anglais!"* And, if he is one of the more rabid, racially self-conscious of the Bretons (i.e., one of the most isolated ones), he may add, as bitterly, *"Et les tyrans Français!"* actually forgetting, in his provincial egoism, that he too is French.

"Granite in Their Muscles and Their Brains"—New Hampshire Song

An aloof, remote, proud and stubborn man, the Breton, only half guessing the likeness of the outer world, and not well liking that half. Because then, past contacts with the outer world were in the nature of bitterly resented, relentlessly remembered military invasions; and because the busy movement of modern trade finds no use for, or need of, this peripheral, little-producing land and its simple, backward people, changes have come slowly here, and folk-survivals are common. It is only in such backwaters of a modern

world, for instance, that women still wear the identical dress and gargantuan, inexplicable head-gear of long-past generations—centuries, even; and that men trim their oddly-fashioned clothes with vivid yellow and scarlet embroideries and big brass buttons; their unwieldy, velvet-trimmed hats with silver buckles and three-foot velvet streamers. It is a fact that the ruff—wide, tightly-fluted, stiffly starched—is still in the height of fashion in this land, where

FIG. 7. The march of modernity is to be seen here. A wood-cutter's house on which the thatch has recently been replaced grotesquely by galvanized iron, crudely molded to shape over the dormers. The result, not unique with this example, is efficient, but most distressing.

it is universally worn by a peasantry to whom "fashion" is an unknown word, while "tradition" is still all-powerful.

It is only in such rare, isolated spots that one finds peasants humbly pulling their hats from their heads as a stranger passes by, and standing respectfully aside in a fixed, traditional posture. Such peasants recognize in the attire of the stranger the dress of

their "betters," and accord such betters the identical courtesy that long dead ancestors once offered a liege lord.

It is only in such still wells of surviving medieval custom that whole villages still march in rapt, chanting, candle-bearing procession, or kneel unwaveringly, untiringly, thru hours-long wayside services, feeling themselves a part in some terrific mystery which is to better the coming year.

It is only in such twilight zones of naiveté that young men, at their most self-conscious age, march on their wedding day from church door round and round about the town, an increasingly wilted bouquet held stiffly in one hand—an increasingly agonized bride, limping in her unaccustomed shoes, on the other arm. Ahead, a strident accordion or shrilling *biniou;* behind, relatives and friends in formal procession—orderly enough at eleven in the morning when they emerge from the church, but often a staggering, ribald crew by six, when all the drinking places have been visited and the groom's pockets are empty.

It is these same procession-loving folk who people the weekly markets, driving in to the village from far-off, recessed farm-hamlets on high, two-wheeled carts which survive as the universal conveyance in this region where poor roads form a quite natural exception to the elsewhere splendid highways of France. For such roads, wheels must be heavy, and strongly built, if they are not to fall apart as the cart rattles down a hill. On the other hand, four such wheels, plus the cart's load, are more than one horse can draw up the succeeding ascent; and one horse, rather than two, fits the size of these Breton farms, however useful an extra beast might be on market day.

The market, itself, with its puppet-show, crude merry-go-round (for the grown-ups, who have earned such luxuries, rather than for children, who, indeed, have been left at home), trinket booth and tart-stand, offers endless examples of artless naiveté, while the great fête-days, with their dancing on the green—a wild revel never-to-be-forgotten—display these gentle folk at their adolescent best. Again it is the grown-ups who disport themselves; hauls are too long, and conveyances too scant, to justify even short trips among the children. And so again the granite roads act that children may stay—children.

Here, of course, the wooden shoe, or *sabot,* more generally used than in Holland, still suffices among the peasants on all but the greatest fête-days. The peasant bread is made of buckwheat, the local grain; the dough mixed in great brass bowls, no longer made, but surviving from some epoch—some mist-hung economic invasion—of the eighteenth century; the baking done, often enough, in bread "pans" of woven willow, wet down to keep them from catching fire in the oven. Such wine as is to be bought comes from French Algeria, rather than southern France, since boats bring wine into this land of many harbors from coastal Africa more cheaply than railroads can bring it from interior France. Here the grain and hay is cut by scythe—an unbelievably cumbersome, heavy, locally-made contrivance—or by the slower, even more back-breaking sickle, the women following the men and gathering the crop into bundles, while children trail behind to cull every last grain or blade.

Hand in hand with these archaic survivals lives that most striking one of all—the Breton language; not a French patois, but a distinct language, branch of the Celtish tongue. One frequently runs across peasants who have no single word of French. While a more progressive friend acts as interpreter, they shrug, as tho to say, "that foreign language? No!"

Travelers in African jungles have made familiar the picture of naked savages gathered about a phonograph, hearing "canned music" for the first time. It is the accepted proof, this picture, of a virgin people; isolated, remote, untouched by modernity. Last September, in a Breton town of 7,000 inhabitants, and one of the larger towns of remote Brittany, the writer saw a similar picture. Clothed, and no more "savage" than the rest of us, the people of that town had gathered to hear a strange device which a local grocer had brought to town on approval.

Filling the cobbled street from wall to wall they stood, hushed and thrilled, from seven in the evening until ten, while orchestral music and operatic arias poured out of the little shop's open door. Between numbers they whispered a little, but there was no whisper while that magic was in the air. They faced the open door as they might have faced an altar; seeing nothing, but turned worshipfully toward that music, which was so different from their own biniou

or their own ancient chants. For three nights the town poured out to savor this miracle. And each evening, promptly at ten, the music stopped, and the people, still hushed and wondering, faded away into the neighboring streets and their homes. For at ten, in the villages of Brittany, all "noise" must end; it is the law of the peninsula. One *sleeps* at night in this strange land!

BRITTANY SMELLS GASOLINE—FOR AWHILE

In the long run, geography is dynamic, not static. Human activities have never yet been so nicely adjusted to a given environment that an improvement in technology, a new appreciation of some earth element, or a new relationship to another environment, has not sufficed to set the puppets dancing in new patterns.*

The Brittany pictured here is the Brittany of today, not of tomorrow. Like to his ancestors as is the present Breton, he is about to change—has, indeed, entered the transitional stage between two phases—two epochs—in his geographic history. His peninsula has again been invaded; his remoteness is breaking down; his individualism is swiftly on the wane. Tourists and their autos, hunting out remoter and remoter spots—quainter and more quaint places—bring hotels and garages in their wake. The choicest old houses are being turned into antique shops or tea-rooms, with defacing English signs across their ancient lintels. Sails will soon give way to motors; natives will become, first, self-conscious, and then, imitative; and costumes and customs will swiftly go into the discard as they have already done in the least remote, north-shore port towns. It will pay to improve the roads, and the sturdy, jolly carts will disappear. New ideas as to buildings will creep in (Breton conservatives are already ranting about the "French" architecture which is going up, here and there), and picturesque old bits will be "improved" beyond all interest or liking. The modernization—standardization—of Brittany will have taken place.

And then, some day, remoteness, one suspects, will take hold again. For, its unique quality gone, the invaders will pass Brittany by, and an ephemeral prosperity will have ended. The old Breton will be gone, but again will Brittany stagnate. Again only a land

* Mr. Kemp will contribute in the near future an article, "'Queen City of the Lakes': A Geographic Pageant." This title covers the study of distinct progressive adjustments to environment in a given spot during a relatively limited period of time. —EDITOR.

of thin crops and lean hauls, Brittany, the granite peninsula, will rest where it finds itself when the tide turns. A hundred years from now, unless there *is* some "new technology, a new use for one of its elements, or a new relationship to outside regions," Brittany may well be on its way toward quaintness again; toward a new local integrity.

But alas for the present breakdown of its isolation—its dawning day of tourist prosperity. For a hundred years from now, the "quaint" Breton will be "picturesque," not in ruff and embroidery, stone and thatch, "pardon" and wedding-procession: he will be perpetuating, worse luck to him, the costumes and customs of today, when he wakes for a little, sees and copies the world he finds knocking at his door, and then goes back into his long sleep.

For Brittany, always a land of granite, little harbors, and humid, cool-summer climate, will again, as far as one can now see, be also a land of peninsular isolation.

THE PROBLEM OF OUR WOOD PULP AND PAPER

ALBERT G. ELDRIDGE
State Normal School, North Adams, Mass.

How We Came to Have Paper

Paper is the result of an age-long search for a material on which accurate and lasting records can be made easily. The cairns, the cave drawings of primitive men, the Alaskan totem poles, the wampum belts of the American Indians, the clay tablets of Babylon, the papyri which Egypt gave to the ancient Mediterranean world, the waxed tablets and the parchments which the people of Europe used for hundreds of years,—all these were only a few of many attempts to meet the need for a satisfactory material for writing.

Real paper, first suggested perhaps in India before the birth of Christ, is said to have been invented by Ts'ai Hung, Chinese minister of agriculture, about 130 A.D. He used the inner bark of the mulberry. A hundred years later the Chinese were making stronger and better paper from cotton and linen rags, and a cheap paper from rice straw. China had books printed on paper about 1000 A.D., nearly five hundred years before Europe.

The knowledge of rag paper came thru Turkestan to the Arabs, and by them was brought before 1300 to Spain, whence it spread

gradually thru western Europe. The invention of movable type by Gutenberg about 1450 found paper ready for the press, and cheaper books possible. Every sheet of this paper was made by hand, as it was in China.

China is still making rag paper by hand, but the western world now uses machines; and altho we use rags for our fine papers, we have found ways of making quantities of cheaper papers from a great variety of materials, such as esparto grass, hemp, straw, and corn stalks, and especially from wood. It is thought that the idea of making paper from wood pulp came from watching the building of a wasp's nest.

We Live in an Age of Paper

The modern use of paper is not limited to writing and printing. Pulp products have increased until some writers are saying that we have advanced from the ages of stone, bronze, and iron into the age of cellulose. Let the reader imagine himself for a moment in a grocery store. What an array of paper cartons is on the shelves! He buys some of them with paper money, and proceeds to a dry goods store, where several articles made of rayon, often a product of wood pulp, are wrapped in paper and charged to his account on paper, to be paid for later by a paper bank check. On his way home he gives a paper ticket to the conductor, reads his newspaper, and learns that the railroad carwheels are probably made of wood pulp. So also may be the carriage in which rides his infant son, the "leather" with which his automobile and some of his furniture are upholstered, the building paper in the walls, the wallboard ceilings, the linoleum in the kitchen, the tiles in the bathroom, the wallpaper in the living rooms, the pictures, the books, the magazines. He turns on the electric lamp, which he notes has a paper shade, and finds in his mail this issue of the JOURNAL OF GEOGRAPHY, convinced by this time that in studying the wood pulp and paper industry we are making inquiry into a matter of prime importance in civilized life.

Pulp and Paper Industry in Various Countries

The pulp industry of the world is divided, in order of importance, among the following countries: United States, Germany, Canada, Sweden, Austria and Czechoslovakia, England, France, Finland, and Norway. Paper is produced in many other countries, but in quantities too small for export. We shall summarize the

situation in Europe and Asia, and then give our attention to that in North America, north of the Rio Grande, and consider its causes, insofar as they may be determined.

Germany's manufacture and trade promise to exceed their pre-war development. Formerly it received large quantities of pulpwood from Russia, but its present supply is coming largely from Czechoslovakia and from East Poland. If this supply can be maintained, it will continue to be an important factor in the world's paper markets.

Norway, Sweden, and Finland are well adapted to the industry. Their forests are largely coniferous, and so make good pulp; they have ample water power; they can obtain chemicals and other supplies at reasonable prices. Norway is reported as overcutting its supply, and Sweden is now using its wood as fast as it is grown. Finland, however, could increase its production materially without sacrificing its timber resources.

Austria and Czechoslovakia produce enough to meet their own requirements, with a comfortable surplus for export. In both countries there is an abundance of standing timber suitable for pulping, conserved by efficient methods of forestry.

England and France make large quantities of paper, but produce little pulpwood. Both of these countries use large amounts of esparto grass; they also import much pulp, especially from Norway and Finland. Neither England nor France exports paper to any great extent, except high grade rag and esparto.

Japan is like England and France in that it is hampered by a lack of wood for paper, and must depend upon imported pulp. The future of its paper industry depends largely upon the future forest policy of Russia.

Russia is at present a land of undeveloped opportunity, for in Russia, including Siberia, are the greatest stands of pulpwood timber in the world.*

UNITED STATES THE WORLD'S GREATEST CONSUMER

In 1810 the United States used only 3,000 tons of paper, or 1 lb. per capita; in 1859 it was only 8 lbs. per capita. With the advent of woodpulp, however, our consumption rose with exceeding

* For the facts in regard to the general condition of the industry in Europe and in Asia I am indebted to Mr. Norman S. Meese of the Bureau of Foreign and Domestic Commerce.

rapidity, so that in 1926 it had reached the amazing total of 11,807,000 tons, or 202 lbs. per capita. Paper boards and newsprint together accounted for 61 per cent of this total. In the face of advancing prices for pulpwood, which rose from $4.95 per cord in 1899 to $15.48 in 1925, the increased use of paper has been startling.

Since 1875 the United States has been the world's greatest paper market. In 1920—to use the most recent figures available—American consumption was 56 per cent of that of the entire world, and our per capita consumption was twice that of Great Britain, which in turn far exceeded that of Germany, Sweden, Norway, Japan, and Russia, in the order named.

UNITED STATES THE WORLD'S GREATEST PRODUCER, BUT WITH THE AID OF FOREIGN RAW MATERIALS

Our production in 1926 was estimated by the American Paper and Pulp Association at 10 million tons, or about 85 per cent of the amount used. This places us far ahead, even of Germany. But it does not tell the whole story to say that we produce 85 per cent and import only 15 per cent of our enormous consumption of paper. Our present dependence upon other countries for raw materials is an eye-opener to those who are accustomed to think of the United States only as a land of limitless resources. In 1926 only 45 per cent of our raw materials were of domestic origin, 41 per cent were imported from Canada, 15 per cent from Norway, Sweden, Finland, and Germany, and 1 per cent from other countries; our exports of raw materials were 2 per cent, making our net dependence 55 per cent, enough to make us comparable to such countries as England, France, and Japan.

To what extent "raw materials" means wood pulp is indicated by the fact that in 1919 wood supplied over 90 per cent of the raw material for paper made in the United States. Wood pulp, which leads all other materials, is supplemented to an important extent by waste paper, 85 per cent of which is derived from wood. Comparatively small amounts of straw, rags, and manila stock are also used, but because of the predominance of wood pulp that is the only raw material which will be considered further.

CANADA, OUR GREAT SOURCE OF SUPPLY

The tremendous demands of the American paper market made it inevitable that in time we should have to buy more and more

from our neighbor on the North. Paper making was started in Canada in 1803, but the industry grew slowly until near the close of the century; since then its amazing increase is indicated by the following comparison:

Year	*Mills*	*Capital*	*Number Employed*	*Value of Annual Production*
1881	5	$92,000	68	$63,000
1927	114	$579,853,552	32,876	$282,888,089

In 1890 Canada's pulp and paper exports were valued at $120; in 1927 they were $176,633,728. Today pulp and paper making is its greatest manufacturing enterprise. Canada is making one-third the total of the world's newsprint, and producing half of all the pulp which enters into newsprint. In 1927 more than half of all its exports to us were made up of wood, wood pulp, and paper.

Newfoundland

In Newfoundland also the industry has reached large proportions—if the size of the country be considered—and ranks with fishing in importance. Great quantities of pulp are sent to Great Britain and to the United States. In 1927 over 200,000 tons of newsprint were manufactured, about 40 per cent going to England, and 60 per cent to us.

In What Parts of North America is the Industry Located?

Let us now look at the map which gives the distribution of paper and pulp mills in North America in 1922. Inspection of this map shows that most of them are in New England, the Middle Atlantic and Lake States, and near the St. Lawrence River, in Ontario and Quebec. A few are scattered thru our southern states, some are near the Pacific Coast in both countries, and a few are in Newfoundland. If we should draw a line northwest from the entrance of Chesapeake Bay to the Ohio River, then follow down the Ohio and up the Mississippi, then go around the northern side of the Great Lakes and along the St. Lawrence Valley, keeping a little northwest of the river itself, this line would include most of the mills shown on our map.

The Bureau of the Census also tells us that in 1925 our largest producers of pulp were Maine, New York, and Wisconsin, and that the greatest values were added by manufacture in the paper and wood pulp industry in New York, Maine, Wisconsin, and Massa-

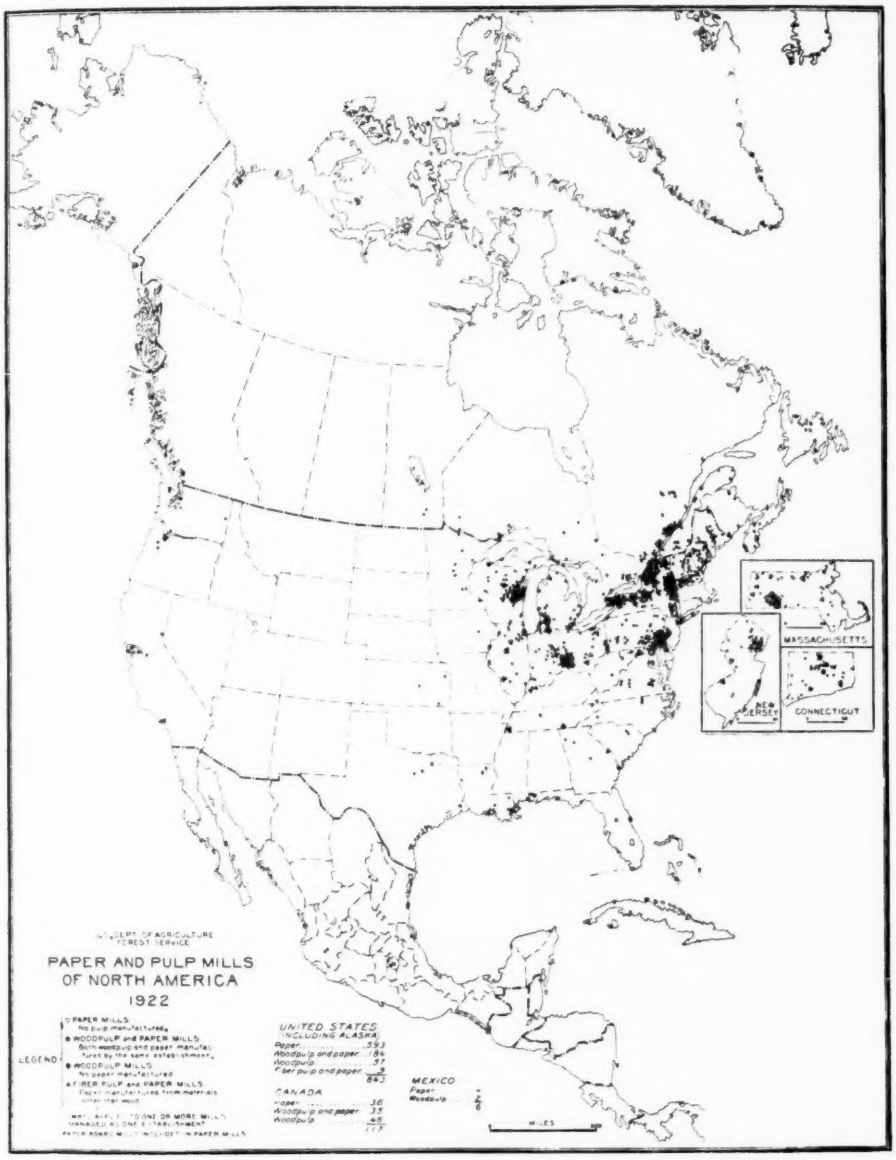

FIG. 1. Paper and pulp mills of North America

chusetts. In Canada, Quebec and Ontario are reported as the great producers, with British Columbia far behind, tho making rapid gains. Let us remember this map and these facts, and see if we can find out why the industry is concentrated in what is really a small part of North America.

How Can We Account for This Concentration?

The chief influences which have been at work to develop in this area an enormous pulp and paper industry are: raw material, transportation, power and fuel, water, capital, labor, machinery, market, and politics.

Raw Material. This must be suitable, abundant, cheap, and preferably near. As long as paper was made only from rags, mills were located near the larger centers of population on the Atlantic Coast. Here they could secure their limited supplies of raw material, and supplement them at least expense with rags from Europe. This is one reason why the industry began near Philadelphia, and later developed in Massachusetts. It grew slowly because of the shortage of rags. During the Revolution paper was so scarce that every scrap was used, and newspapers were printed even on the margins. In 1801, when Zenas Crane and two others were ready to build the first paper mill in western Massachusetts, they advertised for material under the following captions:

AMERICANS!

ENCOURAGE YOUR OWN MANUFACTORIES

AND THEY WILL IMPROVE.

Ladies, Save Your Rags!

After 1866, when wood pulp came into use, it became just as necessary to consider available supplies of the new raw material. The new process required a wood which would pulp readily, which would yield a long, strong, yet soft and tender fiber, which would bleach, dye, and size well, and make a good product. The best woods for this purpose were found to be spruce, hemlock, pine, poplar, and fir, in the order named. Fortunately for the established mills in the northeastern part of our country, altho much of the virgin forest had already been cut, great areas of second growth timber were available, especially in the Adirondacks and in northern New England. Much of it was on rough, stony, glaciated land,

unsuited to farming. It must have seemed abundant enough to last indefinitely.

This supply was also cheap and near. Until now it had been almost valueless, but the new demand caused a gradual advance in the price. Yet it was still so cheap that for a long time little thought was given to maintaining the supply. That we have drawn too heavily upon these resources in the United States is more than apparent, as we face the fact that we are now 55 per cent dependent upon other countries for raw material.

It is well for American pulp and paper mills that the Canadian supply is also suitable and abundant, and still relatively cheap and near. These great coniferous forests, especially in the Laurentian upland, seem destined to supply us for a long time to come. Canada's stands of pulpwood are estimated at 870 million cords, one-half of which are accessible, and which are now being cut at the rate of five million a year. Without counting new growth, and without allowing for loss from fire and disease, it has enough to supply us both well into the next century, before which time it is hoped that thorogoing policies of afforestation will begin to show results in both countries. It must be remembered that it takes a tree a long time to grow. A spruce will mature in one hundred years, tho it can be used for pulp when much younger than that.

The Canadians enjoy a further advantage in regard to raw material. For the large scale production of today, large areas of forest must be available. In the eastern part of the United States, timber ownership is largely individual, in small lots, with many owners. In Canada the acquisition of large tracts is still possible, and the cost of management is thereby reduced.

Transportation. This must be dependable and cheap. Let us see how the forest is brought to the paper mill. In the frosty air of a Canadian winter the sharp blows of axes ring out over the snow. Trees crash, saws drone and screech, men call to one another, horses strain and sweat as the logs are trailed out to the main road. Here the logs are piled into skidways which may be twenty or even thirty feet high. The higher they are the more easily they may be loaded onto sleighs later, and the less snow there will be to shovel off the top before loading.

Early in the season the main roads have been leveled up and sprayed with water, so that the icy surface will make it easy to draw on runners the heavy loads of logs. Sometimes, instead of

draft horses, a steam or gasoline tractor may be used, with caterpillar traction and sleigh runners. Such a tractor may haul at one time eight loads of logs. The logs are dumped upon the frozen river, or on its bank, to wait for the spring.

Ten hours of swinging the axe, of sawing logs, or of driving horses or tractor, interrupted only by an outdoor lunch, makes the

FIG. 2. Snow makes easier the transportation of pulpwood. Valley of the Gatineau River, Quebec. Courtesy, International Paper Co.

logging camp look good to the tired men. It is built largely of logs, with lumber or clapboards on roof and gables. The big box stove is filled with blazing, dry wood, and the place is warm and comfortable. Wet socks, sweaters, mittens, and other garments are hung up to dry. A baked bean supper is enjoyed, and the evening is spent in grinding axes, repairing clothing, and card playing. Or perhaps the fiddler tunes up, and starts everyone off on an old French-Canadian chanson, while outside the snow drifts against the windows.

To be sure, some of the camps are less romantic than this. One in Maine has sanitary dormitories, iron beds, bed linen changed as often as used, shower baths with hot and cold water, the best of food, motion pictures and other entertainments, even in the dead of winter.

But for the men in either type of camp there comes an end to their work as lumberjacks. When the ice goes out, and melting snows bring on the spring freshet, the logs start on their long journey downstream to the mills. Now the log drivers must be on the alert every moment, especially in the smaller rivers, to keep the logs moving, and to prevent the formation of jams. The drivers wear long boots with sharp caulks, but the round wet logs are unstable and very slippery, and the day's work is full of danger. This danger is increased if a jam does occur, and weeks of patient work, sometimes aided by the use of dynamite, may be needed before the drive starts moving again. It may go over wild rapids, then along miles of smooth, swift water. It may come to a lake, where huge rafts are made, and a steam tug helps it on its way. In all, it may go 100 or even 200 miles. But at last it reaches the mill, where the logs are stacked until needed.

It is clear that in the North snow and ice and the spring freshet are of great help in getting out the pulpwood with a minimum of expense. Fortunately many of the rivers of Canada, of New England, and of New York flow in a southerly direction, toward the markets, and transportation costs are further lessened. These rivers bring thousands of cords of pulpwood year after year. The Great Lakes are also a highway for Canadian pulpwood on its way to this country. But much also comes by rail, sometimes 500 or even 1,000 miles. In the South, year-round logging is in use, and the logs may be hauled to the mill in horse-drawn wagons, or shipped by rail.

Of course we depend upon our railroads for the transportation of woodpulp and paper, as well as pulpwood. The region in which our industry is concentrated is well served with railroads.

The cost to the manufacturer in the United States who buys his pulpwood in Canada is said to average about $4.00 a cord for transportation after delivery to railhead or river. The manufacturers try to keep this cost down to a minimum, and at the same time keep down the cost of transporting the finished paper to market. Many of the American and Canadian mills are located on the route which must be followed by the raw material on its way to market, and so secure an important advantage.

The fact that only a few mills are to be found on the Pacific Coast or in Alaska, where raw material is abundant, may be accounted for in part by the cost of transportation. This is true to

some extent of the South also, but there the prevalence of hardwoods seems to be the larger factor. Both of these influences work at present against the extension of the industry in the South.

Power and Fuel. Power and fuel must be available in enormous quantities. The production of wood pulp by grinding requires from 66⅔ to 100 horsepower per ton of wood. Modern paper making machinery is a hog for power. In 1925 the industry in the United States used 2,427,010 horsepower, about 42 per cent of which was developed by steam engines and turbines, 38 per cent by waterwheels and turbines, and 20 per cent by electric motors driven by purchased current.

Nearness to coal fields, such as those of Pennsylvania, Illinois, or Nova Scotia, to developed waterpowers, such as those of New England, New York, or Quebec, and to sources of electric energy, such as Niagara Falls, is thus seen to be a factor. A good water power is particularly desirable, especially if it is controlled by the company.

The great amount of power needed tends to concentrate the industry near the best water powers. At South Hadley Falls in Massachusetts the Connecticut River drops seventy feet in two miles. A dam built in 1847 made available one of the greatest water powers in New England. The city of Holyoke and the manufacture of fine paper were results, and because of the superior water power Holyoke was able to surpass in volume of business the mills of Berkshire County, located on the lesser water powers of the Housatonic.

The region of the wood pulp and paper industry of North America is also the region of the greatest development of water power, of coal mining, and of electrical energy.

Water. A wood pulp or paper mill needs also an abundant supply of good water, as 100,000 gallons of water are required to make one ton of pulp. One paper company uses 150,000 gallons per ton, or 75 gallons of water for each pound of paper. Some of the largest mills use more water than some of our large cities. The supply must be dependable. The mills indicated on our map are in a region of abundant rainfall, well distributed thruout the year. The flow is safeguarded by the forests, and maintained by thousands of glacial lakes.

In making the finest papers, only water that is clear, pure, and soft may be used to wash the fibers and carry the pulp. Water

which contains sediment, which is off-color, or which has a high mineral content may injure the product. The greater part of our industry is located in glaciated country, where the streams take up relatively little silt from the gravelly soil, and where the lakes act as natural settling basins for the removal of silt. The purity and abundance of the water supply was one of the deciding factors in the early establishment of the industry in western Massachusetts.

Capital. Rommel says in "Farm Products in Industry," "A mill producing 100 tons of pulp daily will need at least $3,000,000 to start on." Professor Malcolm Keir of Dartmouth says, "In 1800 a paper maker could commence operations with a capital investment of $5,000 or less, but in 1900 the man who proposed to manufacture paper from mechanical pulp had to have command of $1,500,000, and the more he exceeded that figure the more secure he was."

Paper making today must be on a grand scale. The purchase and development of large power sites, and often of large tracts of forest, the erection of mills, the purchase and installation of expensive machinery—a Foudrinier paper making machine costs up to $500,000—these all mean that capital in large amounts must be invested whenever a new mill is started. Obviously, such capital becomes fixed, and the industry may not be moved without great loss.

The development of our industry has taken place where capital has been abundant—relatively—and interest rates low. The industry itself has created more capital for reinvestment and expansion. Now that higher prices for raw material and for transportation threaten, many a manufacturer would move if he could, but the fixity of his capital makes this impossible.

Labor. Paper making requires skill. In early days this skill was largely manual; now it is manual and technical.

In 1690 William Rittenhouse, a Mennonite bishop, established near Philadelphia the first paper mill in America. His ancestors having made paper in Germany for generations, he taught the art here to many others. Consequently, in 1787, out of a total of 63 paper mills in the United States, 48 were near Philadelphia. This was because the Quakers had welcomed the Mennonites, whose beliefs were similar to theirs. As England was importing most of its paper at this time, and as Germany was well ahead of it in the

art of paper making, it was natural for those Germans who came to this country to start the industry here. Because they came from a flax growing section of Europe, and were accustomed to the use of linen, they continued to wear much of it in America. Further, they were accustomed to saving their linen rags for paper making. The people of New England, on the other hand, continued to wear

FIG. 3. Rivers help in the transportation of pulpwood. Androscoggin River, full of spruce pulpwood bolts, White Mountain National Forest, New Hampshire. Photo by courtesy U. S. Forest Service

in their cooler climate the wool and the leather to which they had been accustomed in Britain. They did not understand so well the art of making paper. So for nearly a century Boston imported all its paper, until it had a mill of its own in 1728. In this mill were trained men who founded many other mills in Massachusetts.

In this present age, paper making requires new skills. The lumberjack and the log driver, classed as "unskilled," must know their jobs. There is usually a good supply of men for the work, because it is carried on in winter, when work on the farms is at a minimum. In Newfoundland many who are fishermen in summer are lumberjacks in winter.

Many of the new skills now required are technical. There is the skill of the forestry engineer which must be used to protect the forest from fire, to control disease, and to transport the logs to the mill. Skills possessed by structural, hydraulic, electrical, mechanical, and chemical engineers are also involved, all of them highly technical.

It is distinctly to the advantage of the pulp and paper industry that it is located in the most highly industrialized part of our continent, with the greatest supply of skilled labor, and the greatest number of schools offering technical training.

Machinery. Pulping machinery is said to be the mostly highly specialized and one of the most expensive types of machinery used in any industry. The high cost of paper making machinery has already been mentioned. In servicing these machines, it is an advantage to be located near correlated industries.

Market. Many of the early mills were started by printers and booksellers, who could use and dispose of the product. Benjamin Franklin is said to have helped to start eighteen of them. When the first mill in Massachusetts was built in 1728, there were twenty-three printers in Boston to use the paper.

The region in which our industry is mainly located today includes most of the great publishing houses of North America, most of the newspapers, and most of the cities. It includes the most densely populated part of our continent, and the greatest purchasing power. This reduces the cost of selling.

Increasing demands of advertising in American business, the growth of habits of reading—the unwieldy size of Sunday newspapers and our numerous magazines are evidence of this—the development of education, and the constant discovery of new uses for pulp and paper, all have their influence in making the United States the best paper market in the world.

Politics. Paper manufacturing in the United States, with the exception of newsprint, is a protected industry. Since 1911 newsprint has been admitted free. With the passage of the Underwood tariff in 1913, Canadians felt that their pulpwood should be made into pulp and paper in Canada. While they were talking of an export duty or even an embargo on pulpwood, American capital in large amounts began to flow into Canada for the establishment of mills there. This forestalled adverse action by Canada, and gave the new mills opportunity to make newsprint for free entry into

the United States. Their advantage in production costs is about 10 per cent.

Note the results. In 1899 we were making 83 per cent of our newsprint from domestic pulpwood. In 1926 we were using over six times as much newsprint; our paper production as a whole had increased greatly, but our newsprint production had increased only slightly—at times it had lost a little—while Canadian production was making great strides ahead. The raw material for our newsprint then came from the following sources:

From domestic pulpwood		24%
From Canada in the form of		
pulpwood	12%	
woodpulp	9%	
newsprint	50%	71%
From Norway, Sweden, Finland, and Germany in the form of		
woodpulp	3%	
newsprint	3%	6%
		101%
Domestic exports of newsprint		1%
		100% net

The effectiveness of the tariff is shown also by the fact that we imported from Canada in 1926 only two tons of bookpaper, as contrasted with over 1,750,000 tons of newsprint. The removal of the tariff on newsprint in 1911 has allowed natural geographic and economic factors to operate more freely, and has given Canada a great advantage.

This advantage is increased by the policy of the Canadian government in regard to the ownership of forest land. In over 90 per cent of the forest area, particularly west of Quebec, ownership is retained by the Crown. Of all the pulpwood available, only one-sixth is owned privately, a little more than one-half is under lease or license subject to government control, and the rest is held outright by the Crown. State ownership of land requires less capital on the part of the company, and state control assures afforestation and continued yield, where this is desired. In certain locations in northern Ontario and Quebec, where the land is well adapted to agriculture, however, reforestation has not been attempted, and in large areas the spruce forest has given way to prosperous farms. The general effect has been to make easy the acquisition of large and consolidated tracts of timber, under govern-

ment regulation. On the Gatineau River for example, one company has assembled a block of 7,140 square miles of Crown timberlands.

FUTURE

The main problem of the paper industry is the problem of securing raw material. As we look ahead we can see that Europe is going to buy more paper, and that further increases in supply must come from Finland, Russia, or Canada. There will be a progressive demand for paper on the part of Turkey, India, China, Japan, and the countries of Central and South America. Just how this demand will be met, nobody can tell. But if our use of paper in the United States continues to grow as it has during the last twenty years, and if other countries are going to compete with us for the Canadian supply, we shall find that there is a limit to what we can get from the Canadian forests, great as they now are. Then the world may have to look to the still greater forests of Russia and Siberia, large parts of which are today inaccessible.

As paper now accounts for only 2.6 per cent of the annual drain upon the forests of the United States, and as a drain of less than 6 per cent would enable us to produce all the paper we need from our own forests, so that we should import no pulpwood, pulp, or paper, we ought to be intelligent enough to solve this problem. Several things we can and, eventually, shall do:

1. When we are ready to pay additional costs for transportation, we can use our pulpwood in Montana, Idaho, Washington, Oregon, California, and Alaska. Either pulp or paper could be made in the West for the markets of the East.
2. From some of the wood now used as fuel we can make paper.
3. Waste paper now makes up 29 per cent of our raw material in paper manufacture, but much waste paper is burned. We should save and use more of it.
4. We can reduce the great losses from forest fires.
5. We can reduce losses from decay, now amounting to 10 per cent.
6. We can reduce losses from insects, amounting to 5 per cent.
7. We can combine saw mills and pulp mills, and use more saw mill waste.
8. We can improve our pulping processes. In the chemical processes only about 45 per cent of the original weight of the wood now appears as pulp.

9. We can develop new processes, to make available the hardwood forests of the Lake States, the South Atlantic States, and the Mississippi Valley States. Somebody is going to make his everlasting fortune by making newsprint out of the southern pine also, but he will have to learn first how to take the resin out of it economically. The soil and climate of the Atlantic coastal plain of

Fig. 4. The Largest Paper Mill in the World, Located at Three Rivers, Quebec. This mill has 4000 square miles of forest reserves from which to draw its pulpwood. Its daily output would make a sheet of newsprint eight feet wide, stretching from the Atlantic to the Pacific. Courtesy, International Paper Co.

the South are well adapted to the growing of the southern pine, and it develops much more rapidly than do the softwoods of the North.

Several plants are already operating in Virginia, Tennessee, and North and South Carolina. The new processes, as they come, will result in an extension of the industry into the South.

10. We can grow much more pulpwood, especially in the Middle Atlantic States and in New England, where great areas that are now being wasted are better adapted to this purpose than to any other. Some pulp manufacturing companies are already growing pulpwood, but the practice must become universal. Canada is alive

to the need, whereas we are acting but slowly. Success will depend upon prompt, thoro, and intense forest management.

11. We can develop processes for making paper from raw materials other than wood, such as bagasse or cornstalks. A material, such as corn, which can be raised in weeks instead of years, would have some obvious advantages. This development is now under way. In 1928 appeared the first book to be published on cornstalk paper.

12. We can practice a little economy—more than a little—in our use of paper.

To assure a plentiful supply of cheap paper will require the active cooperation of the government and leaders of the industry, and the hearty support of public opinion, in putting any or all of the above measures into effect. Which developments will come first we do not know, but we do know that it takes some time to grow pulpwood. Because of this fact the pulp and paper industry of North America will probably be less concentrated in the future, as it continues to respond to the influences of a changing geographical environment.

BIBLIOGRAPHY

1. Lyman Horace Weeks, History of Paper Manufacturing in the United States. The Lockwood Trade Journal Co. 1916
2. Nelson Courtlandt Brown, Forest Products, Their Manufacture and Use. Wiley. 1919
3. Malcolm Keir, Manufacturing. Ronald Press. 1928
4. William C. Redfield, Dependent America. Houghton Mifflin. 1926
5. George M. Rommel, Farm Products in Industry. Rae D. Henkle. 1928
6. Miller and Parkins, Geography of North America. Wiley. 1928
7. J. Russell Smith, North America. Harcourt Brace. 1925
8. Whitbeck and Finch, Economic Geography. McGraw-Hill. 1924
9. Isaiah Bowman, The New World, 4th ed. World Book Co. 1928
10. *Literary Digest*, Oct. 20, 1928, Chemical Farm-Relief by "Ennobling" Farm Waste
11. The Pulp and Paper Industry of Canada, Lecture No. 18. Natural Resources Intelligence Service, Ottawa
12. Canada—Natural Resources and Commerce. Natural Resources Intelligence Service, Ottawa
13. T. Linsey Crossley, The Canadian Pulp and Paper Industry. Journal of the Engineering Institute of Canada, 1921, p. 98
14. A Memorandum of Facts and Figures Concerning the Paper Industry of the United States, prepared by the Research Bureau of The Committee on The Perpetuation of the Paper Industry of the United States
15. John D. Rue, Fifty Years' Progress in the Pulp Industry. Industrial and Engineering Chemistry, Sept., 1926
16. American Forests and Forest Products. U. S. Dept. Agric. Statistical Bulletin No. 21. 1928

17. How the United States Can Meet Its Present and Future Pulpwood Requirements. U. S. Dept. Agric. Bulletin 1241. 1924.
18. The Suitability of American Woods for Paper Pulp. U. S. Dept. Agric. Bulletin 1485. 1927
19. Regional Development of Pulpwood Resources of the Tongass National Forest, Alaska. U. S. Dept. Agric. Bulletin 950. 1921
20. Paper and Wood Pulp. Census of Manufactures, 1925. Dept. of Commerce, Bureau of the Census
21. Paper Making Qualities of Various Fibrous Plants. Forest Products Laboratory, Madison, Wis. 1919

RECONSTRUCTING THE GEOGRAPHY OF ALABAMA

F. A. CARLSON
Ohio State University

Activity or Change is recognized as a fundamental principle of geography. It applies, not only to the description or character of the landscape, but it also concerns the nature of the reciprocal relation between man and his environment. This continual transformation or dynamic property of geography calls for perpetual study, more frequently in some places than others, if there is to be a true record of the relation of the environment to man's distribution and his activities.

Probably no area in the United States has received less geographic attention than the South and most assuredly, there is no region of our Union that has progressed more rapidly and introduced more changes in the landscape in the past decade than the land south of the Mason-Dixon Line. There is a worthy challenge in this southern field, so long recuperating from the ravages of the Civil War, to view an industrial expansion which in many respects has been without parallel in the United States. Many of the past specialized agricultural activities have been replaced with diversified farming; soils that have been reported as infertile or low in plant nutrients have been made productive thru plant adaptation and fertilization; past agricultural sections have been transformed into industrial centers; and millions of dollars are being invested in new manufacturing plants and thousands of men and women are leaving the farms to take positions in them. This entire development has a geographic background. It is an adjustment that fulfills the geographic principle "that man thrives best when his activities are in harmony with his environment."

The reconstruction or the correction of rather obsolete notions of the geography of the South may well begin with the State of Alabama. Owing to limited space, it is necessary to confine this discussion to a few general topics such as the distribution of cotton, the effect of soils on the progress of the people of northern Alabama, the industrial centers, and the mountaineers. The misconception of these subjects, if one can judge from economic and human geography textbooks, is appalling. True, some of the opinions were correct when the books were published and there they do not refer to present conditions, while others have always been misimplications, largely owing to the application of generalities or the lack of concrete information. In fact, it may be safely stated that the fallacy of generalization is responsible for many geographic misconceptions.

Distribution of Cotton in Alabama

An examination of Figure 1 will at once reveal that the northern part of Alabama is the present center of cotton production. Here the total yield as well as acreage is far greater than that in the Central or Black Belt area. The historic Black Belt, the area that gave Alabama the name Cotton State, has lost its supremacy. Probably, pupils who have so frequently interpreted the Black Belt to mean the home of the Negroes and not an area of cotton and black soils, may no longer be confused as it truly is the Negro Belt of Alabama today and not the principal Cotton Belt. Since 1909 the Black Belt has lost 587,000 acres of cotton while the northern half of the State has gained a cotton acreage of 666,000.

Some of the environmental elements responsible for the shift of the cotton belt northward are the boll weevil, the flood waters, the poor soil drainage, and the behavior of the human factor, man. The level lands of the Black Belt are subject to floods and poor drainage, conditions that not only retard or kill the cotton plants but also favor the activity of the boll weevil. Therefore, in all counties of the State, cotton has been moved from lowlands to higher ground. In the north, these conditions are most favorable.

Man as a geographic factor has had much to do with the migration of the Cotton Belt. Large plantations, tenant farming and careless laborers so predominant in the Black Belt are not in harmony with successful cotton production. In the North man has learned to utilize the land in an efficient manner, thru small farms, personal attention and ownership, and a high class of white labor.

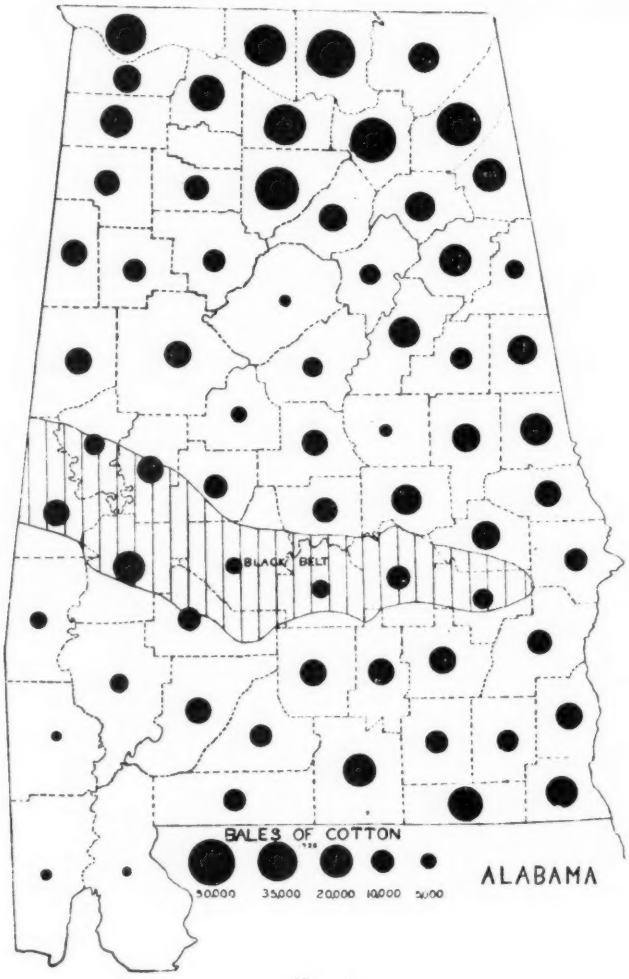

Fig. 1

Soils and Human Progress

The soil is an environmental element of paramount importance. It is largely responsible for the retardation or facilitation of the world's civilization. In northern Alabama and particularly in the mineral district of the northeastern part of the State, the so-called lack of human progress has been largely attributed to the poverty of the soils. There may be a deficiency of aggressive people and a predominance of low standards of living in these lands of irregular topography but these circumstances cannot be attributed with any degree of effectiveness to poor soils. The obvious reason is that the soils are not universally "poor." Numerous valleys, spacious

plateau areas, and undulating hills are favorably blessed with nature's most useful gift, "good soils." The Tennessee Valley, the great Sand or Raccoon Mountain, the elongated Lookout Mountain, the Cumberland Plateau, and innumerable valleys offer a wealth of agricultural resources.

The locational factors, such as distance and accessibility have played a more important part in the rôle of the past human progress than soils in these northern areas of Alabama. The increasing demand for agricultural products for food and raw material; the improvement of transportation facilities; the desire to own homes; and the betterment of farm practices; are largely the foundational factors for the recent agricultural development in the northern half of Alabama.

New Industrial Centers

The Birmingham District has firmly established itself as one of the leading industrial centers of the United States. Located in the heart of a rich mineral region, a fertile agricultural area, having an ample supply of water, and favored with an abundance of good labor and efficient means of transportation, Birmingham is assured of continued progress. However, the glory of its development has somewhat placed in obscurity the potential wealth of other districts equally well suited for an industrial expansion. In this respect, the area that deserves first mention is the Gadsden District.

The map, Figure 2, shows that the City of Gadsden is located about sixty miles northeast of Birmingham. The progressive towns of Attalla and Alabama City are immediately adjacent to Gadsden and the "tri-cities" form what may be called the Gadsden District. The total population of this district has been estimated at 50,000 as compared to approximately 260,000 in Birmingham.

Within three years the total population has increased nearly 30 per cent. Further indications of the growth of the Gadsden District is revealed in the new industrial plants and the enlargement of others previously established. A new braid mill, the first of its kind in the South, has been constructed with an expenditure of $750,000; the Goodyear Rubber Company has formally opened a new tire factory, the first unit of which cost $7,500,000; the Gulf States Steel Company, with many millions of dollars already invested in the Gadsden District, has begun an enlargement that will cost in excess of $5,000,000; and new residences, apartment houses,

hotels, and the like constitute an aggregation of more than a million dollars. The improvement of streets, highways, and rivers is rapidly being made to keep pace with the industrial development.

The most striking impression received in viewing the industrial progress in the Gadsden District is its relation to the natural environment. Within thirty miles are rich coal deposits, iron ore, and limestone; the three essential materials used in the iron and steel industry. Transportation facilities by railway, highway, and

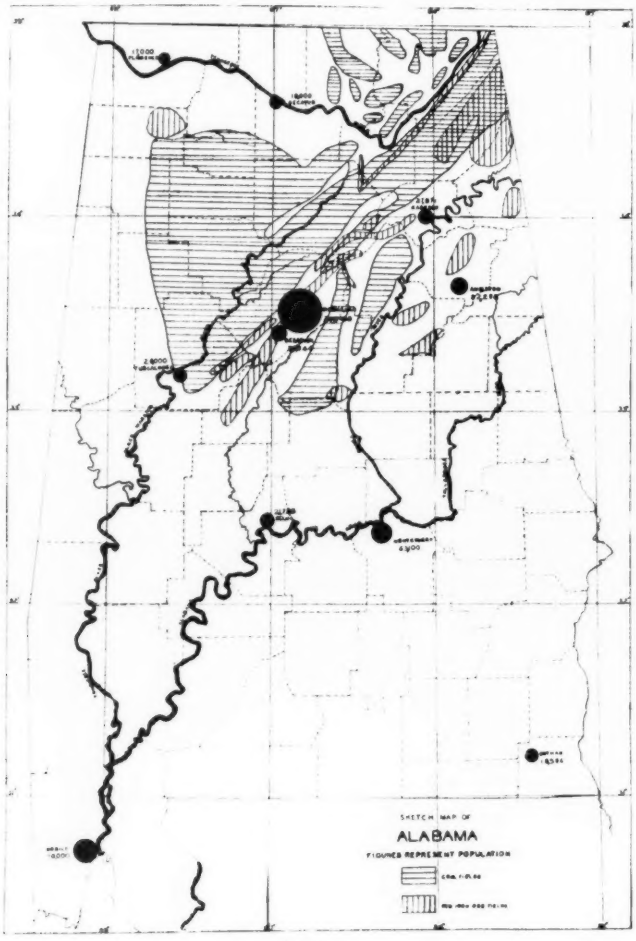

FIG. 2

water are unsurpassed in the South; agricultural resources are in abundance; and the surrounding region can supply the necessary labor. On the basis of natural resources, the Gadsden District ranks in the same class with Birmingham, and in some respects it

may be considered superior. It is only another illustration of the growing South and the necessity of adjusting the geography accordingly.

MOUNTAIN INHABITANTS

The mountainous areas of Alabama are inhabited by white folks; few in number and widely distributed. In general, the fami-

FIG. 3. A view of the Tennessee River valley south of Guntersville, Alabama. (Courtesy, State Geological Survey)

lies are large and exist on a very low standard of living. However, much to the contrary, these mountaineers are not lazy, indolent, and troublesome. Their quiet and contented form of living is very much in common with their environment. They spend the days at hard work, in mines, lumber camps, or in their small cotton patches. Their returns, however, are small and often not sufficient for the purchase of life's necessities. Judged on the basis of opportunities, they cannot be classified as ignorant. Their use of the English language is far superior to that of people living in the most accessible areas. They have retained their native Elizabethan tongue. In most cases, they learn readily and progress rapidly when the

FIG. 4. Blast furnace of the Central Iron and Coal Company, Holt, Tuscaloosa County, Alabama. (Courtesy, Alabama State Geological Survey)

opportunity lends itself. Their advancement has been limited by the past adverse conditions of their habitat, and by the methods used by landowners. These mountaineers occupy land that usually belongs to a city or valley dweller. As a result, the mountaineer or tenant is more or less under pressure. It is difficult for him to get out of debt. A change in land policies would greatly help the mountain people. Their conditions can be well summarized in a statement made by Professor C. C. Huntington—"What man accomplishes or produces depends not only on what he wishes and can do, but also in part, at least, on what he has to do with."

The establishment of new industries in Alabama is in part attributed to the assurance of a supply of native-born labor that is

FIG. 5. Dixie Plant: Goodyear Tire and Rubber Company, Gadsden, Alabama.

loyal, capable, easily trained, and willing to work for reasonable wages. The mountain folks fulfill these requirements with utmost satisfaction.

SUMMARY

The object of this article is not to destructively criticize the existing geographic treatments of Alabama, but rather to emphasize the growing need for revisions or reconstruction. Within the past decade, the changes in the personality of the geographic landscape of Alabama have been so great that many of the old reports on the geography of Alabama are decidedly out of date or obsolete. Each of the topics referred to here may well represent the basis for a more intensive study.

SOME SPECIAL TOPICS IN GEOGRAPHY WHICH NEED SPECIAL CONSIDERATION BY THE TEACHER*

DOUGLAS C. RIDGLEY
Clark University, Worcester, Massachusetts

Modern educational research has shown the need of emphasizing certain fundamental ideas in the various subjects of the elementary school curriculum in order to make sure that the pupils as a group and as individuals shall secure correct and permanent mastery of foundational facts and relationships. There are certain items in the subject of geography that need as definite emphasis and complete mastery, as do the addition table and multiplication table in arithmetic. A few selected items are here chosen to illustrate how the teacher of geography should be alert to discover, and to develop with interest and enthusiasm on the part of the pupils, basic geographic facts and relationships of wide and permanent influence in the individual experiences of the pupils.

The topics to which attention is called in this brief discussion are the following:

1. Direction in space
2. Direction on the globe and on maps
3. Field lessons in geography
4. Weather observation and summary of weather records
5. Interpretation of pictures in textbook and other sources

* Presented before the Department of Intermediate Schools of the Maine Teachers' Association at Portland, Maine, October 25, 1929.

6. The reading of maps on globe, in textbook, as wall maps, and in atlases

Space does not admit of extensive discussion of these topics. They are therefore presented without the broad explanatory treatment which each merits.

Direction in Space

It is important that pupils learn the eight directions in space accurately and well in their early geography work. Extensive investigation shows that these directions should be learned in relation to the sun and shadows by day and in relation to the North Star, Big Dipper, and other constellations at night. A correct image of north, northeast, east, southeast, south, southwest, west, and northwest developed and fully understood in relation to the sun and its shadows by day, and in relation to the stars at night, is a mental concept that can be carried everywhere on the earth's surface and applied to all situations of travel. A concept of these directions derived by school room drill with reference to the walls of the schoolroom; or derived by study of the directions of streets or highways in level regions where streets and highways are laid out with due reference to cardinal points; or derived from the direction in which the schoolhouse or the home faces, cannot be accurately and safely transferred to new situations arising with travel beyond the immediate home locality.

It is recommended, therefore, that teachers help pupils to learn that the sun rises in the *eastern* part of the sky and sets in the *western* part of the sky; that the sun is *south* of our zenith at noon and that the shadows of all vertical objects fall to the *north* at noon; that *southeast* is the direction to the sun in the middle of the forenoon, and that shadows of all vertical objects at this time of day fall to the *northwest;* that *southwest* is the direction to the sun in the middle of the afternoon, and that shadows of all vertical objects at this time of day fall to the *northeast;* that the North Star is always *due north* of our zenith, and that the Pointers of the Big Dipper enable us to locate the position of the North Star; that the other directions can be determined readily when north has been established.

These elementary ideas need refinement as the study of geography proceeds. Thus the sun rises *due east* and sets *due west* only at the two equinoxes; the sunrise point and sunset point are south

of an east-west line in winter with shorter days than nights, and north of it in summer with longer days than nights. The sun is due south of our zenith at noon according to sun time. The true semi-cardinal directions are exactly half-way between the cardinal directions. We locate an object by its direction from another object on the surface of the earth or on a map by naming the one direction leading nearest to it. The Weather Bureau designates a wind as an *east wind* if it blows more nearly from the east than it does from the southeast or northeast.

After knowledge of directions in space has been acquired then these directions are to be applied to directions on the surface of the earth, along streets, highways, and railroads, from school to home, from town to town, from state to state. Special care needs to be given to make sure that the pupil, in whatever grade, refers these directions back to the absolute and universal basis for direction: the sun and its shadows by day and the North Star by night.

DIRECTION ON THE GLOBE AND ON MAPS

We are prone to teach and to believe that always: the top of the map is north, the bottom of the map is south, the right-hand is east, and the left-hand is west. It would be interesting to know how many of the five thousand teachers registered at the Maine State Teachers Association were aware, in using the excellent map of the City of Portland provided with every program, that the top of the map is *northwest,* the bottom is *southeast,* the right-hand is *northeast,* and the left-hand is *southwest:* that from a point at the center of this map *north* is represented by a line toward the upper right-hand corner of the map; *south,* by a line toward the lower left-hand corner; *east* by a line toward the lower right-hand corner, and *west* by a line toward the upper left-hand corner.

The cartographer has given on the map all the necessary data from which to obtain this information about these directions. The map is worthy careful study to discover why the map is given this position on the printed sheet furnished with each program.

On every globe the Equator and every parallel represents *due east-west* direction around the earth; every meridian represents a *due north-south* direction from pole to pole.

Every map on which parallels and meridians are drawn represents *due east-west* by the parallels and *due north-south* by meridians. This is mathematically true whether the parallels and

meridians are straight parallel lines; or curved lines; or complete circles. When pupils begin to make daily use of textbooks and their maps, these fundamental facts of direction should be brought out clearly and emphatically. As the study of geography progresses, due attention should be given to the variety of lines used as meridians and parallels for the sole purpose of showing locations and directions.

Teachers must make sure that their own concepts of these fundamental facts are correct in order to help children to learn the facts correctly.

FIELD LESSONS IN GEOGRAPHY

If each geography class is given two field lessons per year, with proper preparation before the trip and helpful discussion after the trip, the subject of geography would take on newness of life and vigor. One field lesson centered on the physical features of the home locality and one on the industrial activities of the community will furnish concrete images that will put new meaning into the reading of books, the reading of maps, and the reading of pictures.

A view of Portland Harbor under guidance, as seen from an advantageous position on shore, on ship, or on the bridge, will give new meaning to local maps and local pictures, and to other maps and other pictures. A field trip to the Portland wharves, under the leadership of the teacher, will give pupils significant first-hand knowledge about Portland as a seaport, and an ability better to understand seaports thruout the world as they study them thru descriptive text, pictures, and maps.

No amount of reading and talking in the schoolroom can be an adequate substitute for well-planned field trips and their correct summary and interpretation.

WEATHER OBSERVATIONS

Weather observations and their record may be made mechanical and lifeless, or they may give keen appreciation of the "passing weather" from day to day as the weather conditions are observed, recorded, and interpreted. The ever-present weather becomes more interesting to pupils as they learn of its relation to natural laws, simply stated and explained by the teacher, and of man's dependence on weather favorable for human welfare and for the production of crops. Success here, as elsewhere in school work, depends

on the clearness with which the teacher appreciates the educational value of the topic and the enthusiasm manifest in its development.

INTERPRETATION OF PICTURES

Extensive investigation shows that teachers do not consider geography textbooks satisfactory unless about one-fourth of the total space is given to well selected and properly classified pictures. The same investigation shows, also, that a small proportion of teachers use the superior pictures of the geography textbook as a well organized means of definite study and interpretation of geographic facts and relationships. If teachers were as diligent and as enthusiastic in the use of the pictures of the geography textbooks as they are in their request for the inclusion of these pictures in the textbook, new life and new vigor would enter the geography class period. Wide use of mounted pictures, stereographs, and lantern slides add to the effectiveness and concreteness of geography teaching.

THE READING OF MAPS

The power to read maps intelligently and well is one of the unique contributions of geography to the educational development of pupils. The map questions in the textbook guide the teacher to a valuable use of maps. The reading of maps, however, is to be encouraged as an activity in itself, without the aid of questions by author or teacher, just as the reading of the printed page must be accomplished without help. "Reading is the process of interpreting the author's thought from the printed page." This concept of reading applies to the acquisition of thought directly from the study of the printed pages of maps just as it does to the printed pages of text material. A full appreciation of maps as symbols suggesting real areas of land, real cities, real rivers, and real populations will enable the teacher to aid pupils in learning geography thru the reading of maps as happily and as readily as thru reading interesting descriptive matter. With the abundant supply of available pictures, maps, and printed matter of a geographical nature, the geography teacher has an exceptional opportunity to teach reading as a part of the instruction in geography.

Progress in the teaching of geography will come with the wide use of materials already available and with the proper use of the various methods of teaching suited to the abilities and interests of the pupils.

INTEREST-STIMULATING DEVICES

Comparison Map and Graf

The method may be illustrated by a comparison of Australia with the United States in size and in population with New York City. Secure a world map so that both maps will be on the same scale. Trace the map of the United States on colored paper, cut out, and mount on a large sheet of cardboard. Trace Australia on a contrasting shade of paper, cut out, and mount on top of this map by using stiff cardboard rectangles which have been folded twice. Two or three of these rectangles should be mounted in a vertical position between the maps. This holds the smaller map out from the larger and is the same method used in making valentines to hold the lace paper out from the card. The similarity of the United States and Australia in size is very clearly pictured. This method may be used to compare one continent with another in size.

The comparison of Australia with New York City was made by mounting two bar grafs by the same method that the maps were mounted.

Grace Muse
Junior High School
Johnson City, Tenn.

An Interesting Checking Device

Place a list of words, which are of outstanding importance on a subject or a country, on the board. These words should be chosen with much care so that there will be no cause for confusion or uncertainty as to meaning.

Ask the children to use each word in a statement telling something definite regarding the subject or country under discussion.

Much interest will be aroused in any class using this. The author's sixth grade class asked for a similar check on another country.

The following are some of the words the author used in a check on Norway with a sixth grade class.

"white coal"	glaciers	waterfalls
ice-free	"Midnight Sun"	Long
fiords	cheese	mountainous
Oslo	Hammerfest	rack (fence)

Letha D. Shewmaker
Supervisor Geog. Tr. School
State Teachers College
Johnson City, Tennessee

Please send your devices to the Editor. We will be pleased to publish more plans that have been found to be helpful. We have only one more in our files at present.